The Internet as Hyperbole

A Critical Examination of Adoption Rates

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Abstract

It seems to be a generally accepted belief that the adoption rate of the Internet has exceeded that of earlier mass communication technologies by several magnitudes. This paper reviews the historic data related to some of these technologies, draws on actor-network theory as a framework for interpreting such data, traces the transformations and translation of this data throughout the public, political and scientific discourse, and discusses the use of "facts" in modern society.

In both popular and scientific media, there is currently circulating an idea to the effect that use of the Internet has grown exceptionally fast, exceeding that of radio by almost an order of magnitude and growing four times faster than television. The following quote, taken from the bestseller *Successful Cyber-marketing in a Week* is a typical example:

> Cyberfact: It took 38 years for radio to attract 50 million listeners. 13 years for television to attract 50 million viewers. In just 4 years the Internet has attracted 50 million surfers! Those figures can hardly be balked at, especially when you consider the Internet's beginnings. (Gabay, 2000)

In January 2001, I started to look for this particular idea through various Internet search engines. I also asked colleagues and fellow participants in a Usenet newsgroup and an Internet mailing list if they've seen this particular idea. The response was overwhelming. Apart from assorted newspaper interviews where various gurus of the new economy are able to work it into the interlocution, spottings cover a broad range of genres, encompassing some rather dubious advertisements (e.g. Money Making Ideas, 2001, SunSpring Properties LLC, 2001), politics (e.g. Margherio et al., 1998, Gerlach and Kohn, 1998, Mallet, 1999, Schjøtt-Pedersen, 1999, Patel, 1999, Asmal, 2000) and science (e.g. Braa and Sørensen, 1999, Biukovic, 2000).

Most of these do not cite any source. If they do, the reference is usually to a named individual, not a published source. In my collection of sightings, these particular figures for media adoption are attributed to more than a dozen different individuals. E.g.:

> A friend of mine, Dale Cordell […] passed along this quote you may have heard from Bill Gates: "The Internet is the greatest marketing tool since radio, telephone, or television. Internet growth substantiates this. It took 37

> years for radio to reach 50 million listeners, 34 years for the telephone to have 50 million customers, 13 years for television to reach 50 million viewers and 4 years for the Internet to reach 50 million subscribers". (Zapoleon, 1999)

The absence of any specifics (i.e. time, place, and occasion) is typical[1].

Another characteristic is that geographical coverage of the data is usually omitted. When it isn't, the region varies while the numbers stay the same. E.g.:

> A recent Goldman Sachs report on the Internet in Asia notes that while it took radio 38 years to attract 50 million listeners in the region, and television took 13 years to draw the same number of viewers, the Internet has already pulled in its first 50 million Asian users in just four years. (FGtA, 2000)

During a not very systematic bout of statement-spotting carried out by myself and associates in January 2001, several hundred individual instances like this was found, and while these individual instances varies widely in context and content, they all seem to share a set of common characteristics: to affix the qualities of importance and urgency to the Internet phenomenon, and to make it imperative to adapt or risk being left out.

At the core of these narratives lies a set of data points: a series of quantifications that, it is claimed, reveals a particular measure of the adoption rates of specific media technologies.

This essay is an attempt to understand the meaning of these data points. In order to do so, I first present a theoretical framework in which the interpretation can take place, then I re-examine the actual data, and finally, I attempt to synthesise the findings into a revised narrative about what we can learn from this.

Innovation, Invention and Adoption

The theoretical framework used in this essay is mainly taken from diffusion studies, social construction theory and actor-network theory. It is presented in this and in the next section.

An *innovation* is an idea, practice, or object that is perceived as new by some relevant social group which may consider adopting it. *Invention* is the process by which the innovation is discovered or created, while *adoption* is the process through which individuals belonging to a relevant social group take action to make use of the innovation (Bijker, 1995, p. 45ff).

The process of invention is characterised by enormous interpretative flexibility (Bijker, 1995, p. 76f). Conflicting theories and standards, laboratory contrivances, parallel and partial prototypes, demonstration machines and various types of experimental usages abound.

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[1] I have not been able to verify that Bill Gates ever said this.

Sometimes, it leads to failure or rejection (Bijker, 1995, p. 14f, Winston, 1998, p. 7, Rogers, 1995, p. 171), and inventions that eventually are adopted may have a long way to go before they get to that point. The beneficial effect of citrus fruit as prevention for scurvy was established experimentally as early as 1601, but the British Navy did not adopt the practice of eating oranges and lemons on long sea journeys until 1795. In the intervening years, a vast number of different scurvy remedies were competing for attention (Rogers, 1995, p. 7f). Another example is the prototype radio transmitter demonstrated by David Hughes in 1880. It never became more than a prototype because his contemporaries could not see how it could be of any practical use, and interpreted Hughes' prototype as a mundane demonstration of the well known phenomenon of electrical induction (Winston, 1998, p. 68). Adoption can also be delayed by the absence of what Brian Winston calls a "supervening social necessity" (ibid, p. 6f). For example, Francis Ronalds demonstrated a fully working wire telegraph for the British naval authorities in 1816, but the Royal Navy could not see how this device could replace semaphore in communication between ship and shore (Economist, 1999, Winston, 1998, p. 7). Only later in the 19th century, when commercial railway traffic created a need for a long distance signalling system to prevent trains from colliding on single track railway lines and Samuel Morse had perfected his coding system, did the process of inventing the wire telegraph transform into the process of adopting it (Yates, 1989, p. 23f).

For a successful innovation, the process of invention eventually leads to what Wiebe E. Bijker calls closure (Bijker, 1995, p. 84f)[2]. Closure means that the interpretative flexibility of the innovation diminishes, i.e. that the relevant social group reach some sort of consensus about the dominant meaning of the innovation, including such things as usages, characteristics, qualities and standards.

Inscription, Convergence and Irreversibility

It should be noted that the two processes of invention and adoption are not totally disjunct. The process of invention involves many instances of adoption by at least some social group, and innovations are frequently subject to reinterpretation and transformation during the adoption process[3].

This has indeed been the case with all the technologies discussed in the present paper (i.e.: the telephone, the radio, the television and the Internet). The original telephones could only operate over a range of about twenty miles (Aronson, 1977, p. 27) and was not able to sustain two-way communication. Therefore, Bell first proposed that the telephone be used for one-way, traffic, to transmit music, drama and news to a listening audience. Even after the technical problems with long-distance two-way communication had been resolved, this continued to be a popular application the telephone (Briggs, 1977, Marvin, 1988,

[2] Bijker points out that a semiotic component, called "stabilisation", accompanies the social component of "closure". Bijker also say that these are "two sides of the same coin" (op. cit.).

[3] Rogers (op. cit., p. 175) uses the word "re-invention" to emphasise the "invention" aspect of transformations that results from adoption attempts.

p. 209-231). For the telephone to develop into the universal global service we know today, numerous transformations had to be applied to the device. For television, the development of colour and the subsequent plethora of non-compatible colour systems (e.g. PAL, SECAM, and NTSC) that still prevail is a good example that Bijker's notion of closure should not be interpreted too literally. For the Internet, examples of recent transformations are the introduction of the World Wide Web in 1990, the current turmoil regarding broadband services and probably the fracas yet to come that will accompany the transition from the current version of the core protocols to IP version 6.

In addition to these and other technological transformations, political and social entanglements frequently interfere with closure. Some examples: In the United States, it took the Government the best part of a century to sort out how to regulate interoperability and competitive practices between long distance and local telephone carriers[4]. After the first public radio station in the United States commenced operation on November 2, 1920 (Gelman, 1995, p. 80), chaos followed as there was no regulation in place to prevent broadcasters interfering with each other, and this was not remedied until the Radio Act of 1927 set up the Federal Radio Commission (FRC) to oversee the industry (Smith et al., 1995, p. 37). A similar interference problem impeded upon the deployment of commercial television stations, and caused the Federal Frequency Commission (FFC) in 1948 to institute a four year freeze on new transmitters (Winston, 1998, p. 119f).

The perpetual process of transformation and translation that apparently accompany any technology in-use has led to some controversy surrounding the concepts of stabilisation and closure. According to this argument the words "stabilisation" and "closure" have too many connotations of finality and immutability, and therefore fails to take into account that technology keeps changing even after the point in time Bijker's "closure" occurs.

In actor-network theory, the notions of "closure" and "stabilisation" are therefore replaced by a set of less definitive terms. Actor-network theory considers technical objects as scripts or programs of action co-ordinating a network of roles. These roles are played by the objects themselves (e.g. telephones, radios, contracts, etc.), their supporting infrastructure (exchanges, transmitters, etc.), regulatory and financial framework (the FRC/FFC, the Department of Defence, venture capital, etc.) and the humans (inventors, entrepreneurs, users, salespersons, performers, technicians, etc.). Bijker uses the term "sociotechnical ensemble" to denote this network of objects, infrastructures and humans and the roles they play (Bijker, 1995, p. 273f). The central idea is that the innovation takes the part of what Susan Leigh Star (Bowker and Star, 1999) calls a boundary object[5] that is shared between these actors, who attempt to "inscribe" on it their visions of the object's meaning in the world (Akrich, 1992, p. 208, Latour,

[4] The Bell System was finally divested on January 1, 1984 (Brown, 1991).

[5] An object that inhabits several communities of practice and satisfy the informational requirements of each of them (op. cit., p. 16)

1991). These scripts are mediated, translated and even changed as time passes, being the product of domination, negotiation and mutual adjustment. At certain points in this process, there is some degree of agreement in this process. Michel Callon uses the term "convergence" (Callon, 1991) to measure the degree of agreement, and then proceeds to introduce "alignment" and "co-ordination" as two dimensions of convergence. Alignment measures the extent to which actors can agree on the translation. "A successful process of translation then *generates* a shared space, equivalence and commensurability" (ibid. p. 145). Co-ordination measures the degree to which the interpretative flexibility is restricted by rules or conventions. "Strong co-ordination [refer to a network where the] universe of possible translations is relatively restricted, and network behaviour is relatively predictable" (ibid., p. 147). When a strongly aligned and co-ordinated network emerge, we may have a translation of the object's script where:

- it is impossible to go back to a point where that translation was only one amongst others; and
- the translation is pivotal in the shaping and determination of subsequent translations.

Callon calls this "irreversibility" (ibid. p. 150), but hastens to add: "It is also a matter that is never fully resolved: all translations, however apparently secure, are in principle reversible."

For our practical purpose, (i.e. to define the base year for the adoption process), there is little difference between the notions of stabilisation and closure as described by Bijker, and the notions of convergence and irreversibility as described by Callon.

What we are looking for, is a point in time with significant decrease in interpretative flexibility, increasing alignment and strong degree of co-ordination. For all technologies, several candidate dates exist.

For example: Alexander Graham Bell and his financial backers formed the Bell Patent Association on February 27, 1875 and were awarded its first patent (called "Improvement in Telegraphy") the next day. On March 10 the following year, Bell was able to demonstrate a working device. In April 1877, sold his first two telephones to businessman Charles Williams, Jr., who also owned the workshop where Bell conducted his experiments. To use the phones, Williams strung a private line between his home in Somerville and the workshop in Boston (Winston, 1998, p. 53). Under Bell's initial lease agreement, the subscriber was only allowed to use the telephone to connect to exactly one other party (Aronson, 1977, p. 23). The service was advertised as follows:

> The terms for leasing two telephones for social purposes connecting a dwelling house with any other building will be $20 a year; for business purposes $40 a year, payable semi-annually in advance. (Bell 1877 advertisement, cited in Winston, 1998, p. 53)

The first telephone exchange was set up in Boston on May 17, 1877, but it did

not provide the customers it connected with the opportunity to talk to each other. Instead, it was used to receive orders at a central location that were retransmitted to a general express agency (Aronson, 1977, p. 24). The first commercial telephone exchange where subscribers could call each other on request opened at New Haven, Connecticut on January 28, 1878 (Brown, 1991).

Eventually, a service over greater distances than 20 miles was introduced. But while the technology soon ceased to be an obstacle to long distance service, defects in the business model did. In 1885, the Bell affiliated Southern New England Telephone Company announced it was shutting down its 200-mile segment of the long-distance toll line between Boston and New York City, even though the line was a technical success. The regional company received very little of the income generated by the line, and could no longer bear the cost of operating the segment (Brown, 1991).

As innovations go, radio is even more complex than the telephone. Without going into this technology at the same level of detail as the discussion of telephony above, it can be argued that radio was invented in 1894, when Oliver Lodge demonstrated his wireless telegraph (Winston, 1998, p. 69), but adoption of radio as a medium of mass communication in the United States did not take place until November 1920, when KDKA, the first public radio station in the United States to commence operation (Schramm, 1949, p. 547-552, Winston, 1998, p. 77). In the meantime, radio had seen a number of applications, such as wireless telegraphy between ship and shore, communication between military units in the field during WWI, and as an alternative to the telephone for person-to-person calls.

Similarly, the first patent for “television” was filed in 1911, but prior to that, a number of ingenious devices for “telephotography”, “telescopy” and “teleautography” had been demonstrated (Winston, 1998, p. 94). Eventually, electronic prototypes started to appear, but early television was plagued by standards “wars” that significantly delayed public adoption. Then, shortly after the FCC approved the NTSC standard in July 1941, the United States entered WWII, which immediately put further development of commercial television in a hiatus. This postponed the start of commercial television in the United States until 1945 (DeFleur, 1973, p. 83).

It can be argued that the Internet came into existence in 1964 with the invention of packet switching by RAND researcher Paul Baran; or 1969, with commencement of operation of the ARPAnet; or in 1983, with the introduction of the Internet Protocol; or in 1989, when commercial ISPs (Internet Service Providers) such as AlterNet and PSInet started to provide services to the general public (Abbate, 2000, p. 197f); or in 1990, when the World Wide Web and the first Internet web browser debuted, or in 1991 when the Commercial Internet eXchange (CIX) Association, Inc. was established (Zakon, 2001), or in 1993, when versions of the Mosaic graphical web browser for home computers running the popular Microsoft Windows or Apple Macintosh operating systems was released by NCSA (Gillies and Cailliau, 2000, p. 241).

From the above choice of dates, which one best reflects the point in time when, in the USA, these technologies reached the point where their inscriptions may be said to be irreversible? There is, of course, no single "right" answer, but the following are those I believe best meet Callon's criteria of irreversibility.

- For telephone, the base year is set to 1878, when the first telephone switchboard connected 21 subscribers in New Haven, Connecticut. Before the introduction of the switchboard, different users interpreted the telephone in different ways: Some regarded it as an entertainment device (e.g. to convey opera and concerts to remote locations), others as a surveillance instrument (e.g. to monitor the activities in the office from home), and others again as an amusing novelty with little practical use. This changed with the introduction of the switchboard. The switchboard *defined* the telephone as a device connecting exactly two individuals for the purpose of conversation. This alignment is so strong that it has survived up to the present (but after more than one hundred years, this particular is now being challenged by recent innovations such as modems, mobile telephone-like devices, conference calls and the use of the Dual Tone Multi-frequency information signalling system for data entry in home banking and similar applications).

- For radio, the base year is set to 1920, when the first commercial broadcast radio station in the United States commenced operation. This defined radio as a broadcast mass medium, an interpretation that it has retained to the present day.

- For television, the base year is 1945, when the hiatus brought about by the war was lifted and the electronics industry in the United States started to produce television receivers. Before 1945, confusing and conflicting standards, as well as the constraints of the war economy, prevented television from entering into American households. But in 1945, both those barriers were gone, and the adoption of television became irreversible.

- For the Internet, the base year is 1989, when the first commercial Internet Service providers in the United States commenced operation. Up to that point, the majority of users of the Internet had been academics. In fact, a particular set of rules, known as the "Acceptable Use Policy" (AUP) explicitly banned the use of the Internet for "non-scientific" activities (Hannemyr, 1999, p. 23). The decision to allow commercial operators to connect to the net implied that the AUP was abandoned and that the Internet was reinterpreted from a research vehicle and into an open and public infrastructure for information interchange. Up to that point, the Internet could have developed into a number of alternative ways, but by including the commercial actors that sold Internet access and other services to the general public in the sociotechnical ensemble of the Internet, the reinterpretation of Internet into its present form became irreversible.

For telephone, radio, television, this is also when the technologies has almost no "real users" (i.e. less than ten thousand individuals, almost all of them entrepre-

neurs, experimenters and implementers.).

In 1989, there were already around 400 000 Internet users in the USA. While an Internet connection was not commercially available prior to 1989, a sizeable user community connecting to machines located at Universities and research laboratories, existed. In addition, between 1994 and 1995 a number of online services that predate commercialisation of the Internet by several years were connected to the Internet, bringing their huge, pre-existing user bases to the Internet. CompuServe, for instance, was established in 1979 and had in 1994 grown to 3.2 million subscribers, rival America Online had at the same time 3.5 million subscriber, and Prodigy 1.4 million subscribers. (Winston, 1998, p. 333). This sums to around 8 million subscribers[6].

Counting Users

Identifying the year of irreversibility is not the only difficulty we face when comparing telephone, radio, television and Internet data. Equally problematic is the aspect of finding and extracting reliable data about users from historic records.

Ideally estimates would be based on comprehensive and identical surveys conducted on a regular basis over many years. Unfortunately, such data does not exist. Instead there exists a variety of data from many different sources (government agencies, market research companies, industry associations, annual reports, directories, etc.) using different methodologies and measuring different things. Some of these data are good, some are bad, and some are downright misleading. It takes a major effort and knowledge to determine what is good information and what is poor data and should be discarded.

In the present paper, the method for counting users is to first collect all available data from various sources, then to carefully consider each data set and how it fits with the others. A consistent and comparable set is selected and designated authoritative. The remaining datasets are designated supplementary.

In the present study, we only consider data from the United States. The United States is the only major geographical region from which sufficient data sets are available to make this of type exercise possible.

Whenever possible, I've tried to rely on data from U.S. Bureau of Census (BoC) decennial census of housing tables. This are collected every ten years from all households in the U.S. by skilled statisticians. The supplementary data sets are used to interpolate trends between the data points that make up the BoC data.

To supplement the BoC housing data on radio and television usage, I've extracted historic data from a number of different sources, based upon surveys and

[6] There is probably was some degree of overlapping between the subscriber bases, so the total number of distinct subscribers is probably less. On the other hand, it was not uncommon for several members of a household to share a single subscription, so the number of distinct users was probably greater than the number of subscribers.

industry statistics (Schramm, 1949, DeFleur, 1973, Froehlich and Kent, 1991, Smith et al., 1995, Gelman, 1995, Winston, 1998, Famighetti, 1999). These supplemental data are used to confirm the BoC data, and to interpolate the years between the decennial tables.

The BoC decennial housing data does not measure telephone ownership prior to 1960. Early telephone figures are difficult to find and the available data sets of telephone ownership from the last century are not broken down into residential and business phones, by demographics, or by region. As long as the *Bell Telephone Company* was a monopoly, the number of subscribers to it services is a good indicator of number of users, but after the main Bell patents expired in 1893 a number of small competitors sprang up making it difficult to keep track of developments. The following sources have been used to extract figures for number of households in the United States with a telephone prior to 1960: (Iardella, 1964, Pool, 1977, Marvin, 1988, Froehlich and Kent, 1991, Winston, 1998).

The BoC does not include Internet use in its decennial census, but it regularly conducts a survey (Rohde et al., 2000) where approximately 48 000 sample households selected from the 1990 decennial census files are interviewed about computer and Internet use. My number for households with an Internet connection in the United States is primarily based upon these surveys. As supplementary data, I've used a number of different market surveys (summarized on NUA Ltd., 2000) of Internet usage in the United States. Another supplementary source for this data is the quarterly updates published by Matrix Information and Directory Services (e.g. MIDS, 1998) and the Network Wizards domain survey (Network Wizards, 2000). The latter indicate the number of host computers connected to on the Internet (not users), but can be construed as an indication of growth rate.

All the authoritative statistics above resolves into households, not individual users. This means that we need to convert households into individuals. This is carried out in the simplest possible manner, by multiplying the number of households with the average household size (as reported by the BoC) for the year in question. This counts everyone in a household (actual users and non-users) as a "user". It also ignores any skewed distribution of devices between large and small households. This means that the figures entailing should only be understood to be rough indicators of the relative levels of adoption a various times, not exact measures of actual number of individual users. It is difficult to estimate exactly the bias is introduced by the method's inability to distinguish between users and non-users in a household, but it obviously results in some overestimation. Assuming that there is much more likely that there is non-users of a difficult-to-use medium (e.g. the Internet and the telephone), compared to a simpler-to-use medium (e.g. radio and television) this means that this method will overestimate the adoption rates of the Internet and the telephone more than those of the radio and the television. It could be argued that more educated households have fewer members and until recently were the most likely to have access to the Internet, further skewing the numbers.

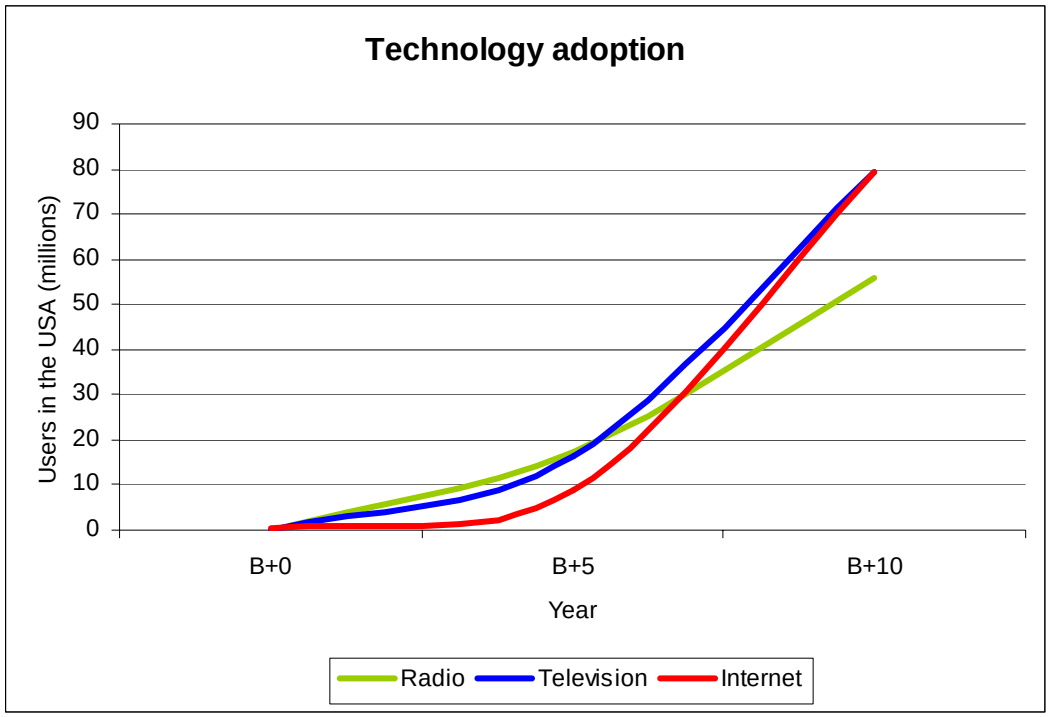

Figure 1: Technology adoption, number of users

The entailing figures are shown in table 1 below. For each of the four technologies, there is designated a base year B, which is the year we start counting uses.

Year	Telephone (B=1878)	Radio (B=1920)	Television (B=1945)	Internet (B=1989)
B+0	0	0	0	0,4 mill.
B+5	0,6 mill.	17 mill.	16 mill.	6,1 mill.
B+10	0,9 mill.	56 mill.	80 mill.	79 mill.
B+15	1,2 mill.	86 mill.	142 mill.	
B+20	3,8 mill.	99 mill.	161 mill.	
B+25	10 mill.	115 mill.	179 mill.	
B+30	19 mill.	133 mill.		
B+35	32 mill.	137 mill.		
B+40	42 mill.	149 mill.		
B+45	59 mill.			

Table 1: Number of users at year B+x

The table shows that of these technologies, only the telephone required considerable time (approximately 43 years) to acquire 50 million users in the United States. All the others reached that benchmark in less than ten years.

Figure 1 plots the adoption rate in the United States for the first ten years for radio, television and the Internet. The graph indicates that the early adoption rates for all three media are roughly of the same order of magnitude.

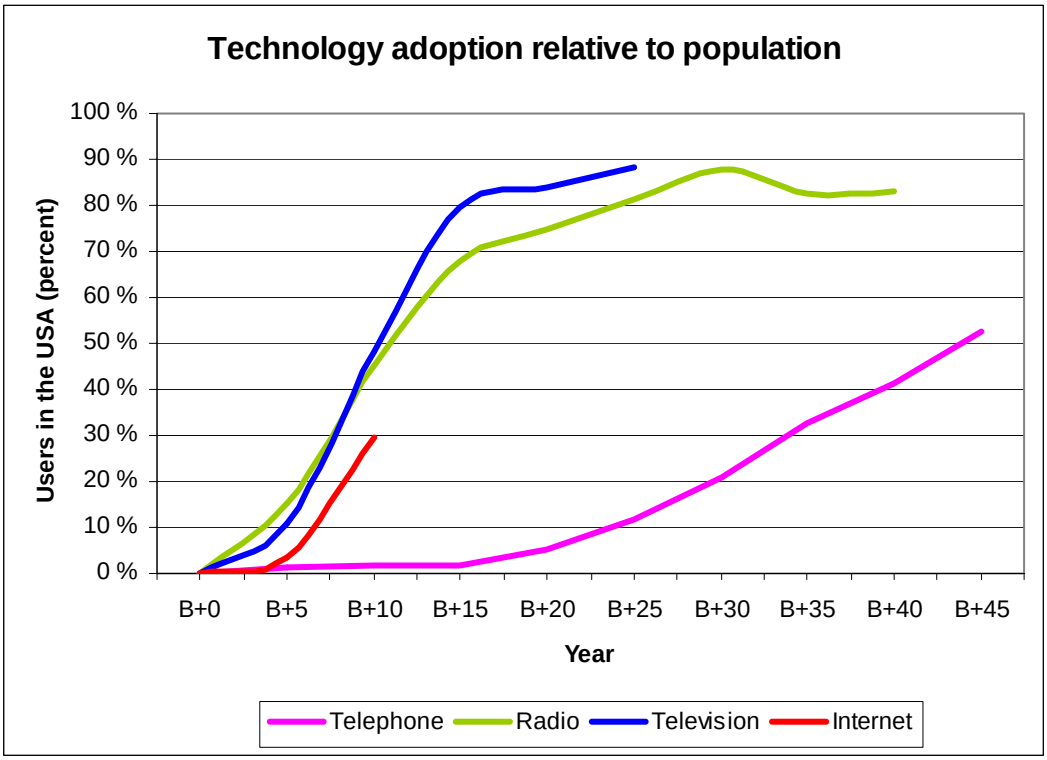

Figure 2: Technology adoption relative to population

This becomes even more obvious if we, instead of plotting the absolute number of users, plot usage as a percentage of the total population. Because radio and television was adopted at times when the population of the United States was lower than it is now, this indicates that the adoption rate for the Internet actually is lagging behind these technologies. The adoption rate for the telephone, as already noted, is considerable lower (figure 2).

Revisiting the Idea

It seems clear from these data that the Internet did grow as rapidly as several other mass technologies shown, but this still doesn't bear out the popular conception that the Internet growth was somehow exceptional or significantly outside the bounds of prior experience. How, then, can such an idea rise and spread?

The earliest example in my collection is a graph appearing in an extensive report about "the future of web-based retailing" from investment banker Morgan Stanley (Meeker and Pearson, 1997, p. 2-2). It is reproduced as figure 3 below.

The report cites "Morgan Stanley Technology Research" as the source[7] for this data. The graph shows radio as starting in 1922 and growing more or less linearly. Television is shown starting in 1950 with a steep initial adoption rate, and

[7] I've tried to contact the authors to learn more about this source. There has been no response.

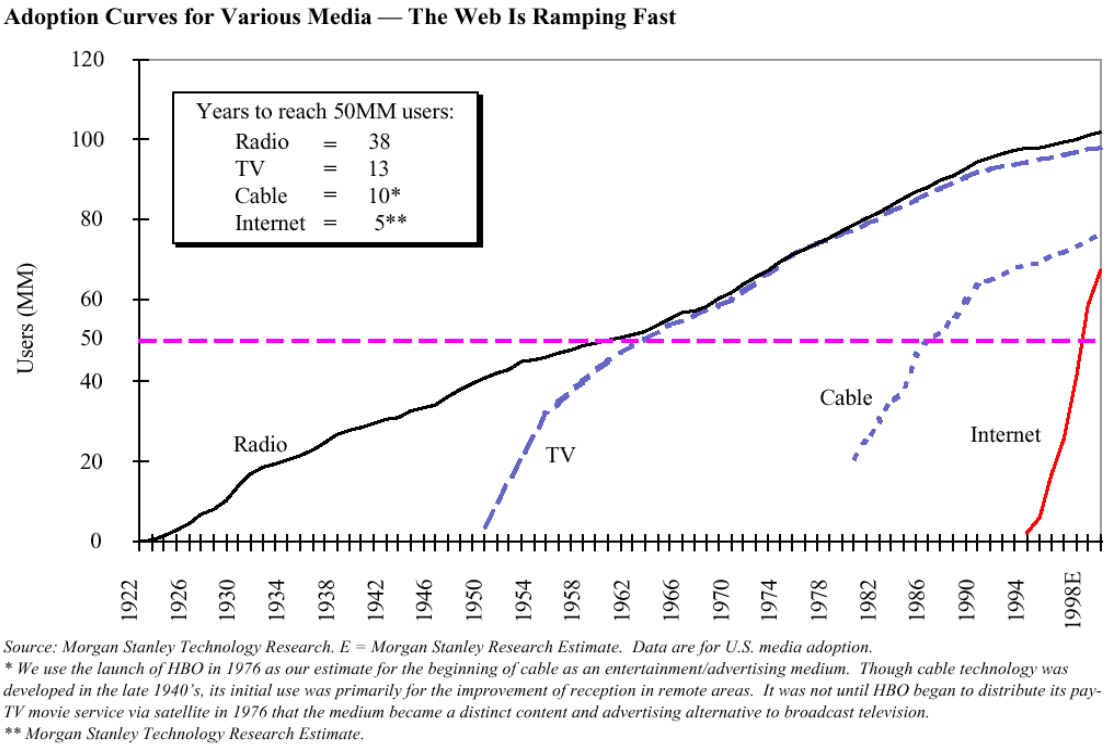

Figure 3: Media adoption curves, reproduced from the Morgan Stanley report

then tapering off from 1956. According to this graph, in 1960 there were around 50 million radio users and 45 million television users in the United States.

One staple trick of the engineering trade is the "back of an envelope" calculation. This refers to using a trivial computation as a means of checking if some data makes sense. If we take the Morgan Stanley graph and re-compute its 1960 data points as population percentages, we find that it asserts that in 1960, 28% of the U.S. population used radio and 25% used television. This is at odds with all other statistic available on media use at that time E.g.: the biannual Roper Organization Surveys (cited in Castells, 1997, p. 313).

Another puzzling feature in this graph is that the birth of the Internet is set to somewhere around 1994, and the number of users at that point is indicated to be very close to zero. According to MIDS, the number of U.S. Internet users at that time was more than 6 million (MIDS, 1995).

I have no way to explain the huge discrepancies between the adoption rate data presented in the Morgan Stanley and all other data I have about the number of users of these technologies at these time. To cut a long story short: I believe that it is very obvious that the adoption curves for radio, television and the Internet presented by Morgan Stanley are balderdash. I have not checked up upon their figures for cable.

In April 1998, U.S. Department of Commerce (DoC) translated the graph in the Morgan Stanley report into the following statement:

> Radio was in existence 38 years before 50 million people tuned in; TV took 13 years to reach that benchmark. […] Once it was opened to the general

> public, the Internet crossed that line in four years. (Margherio et al., 1998, p. 4)

The Morgan Stanley report (op. cit.) is cited as the source for the radio and television adoption rate estimates. As for Internet, the DoC report shortens the time span from five years to four years, and changes the base year from 1994 to 1993. This is explained as follows:

> In 1993, the alpha version of Mosaic, the graphical user interface to the WWW, was released, giving non-technical users the ability to navigate the Internet. This report uses 1993 as the date when the Internet became truly open to the public. […] No exact figures exist on Internet usage worldwide, but different sources point to 1997 as the year when Internet usage approaches/crosses the 50 million mark. For instance, NUA, an Internet consultancy and developer, compiles figures from different research analysts and finds the following ranges of Internet usage: 1995: 8-30 million, 1996: 28-40 million, 1997: >100 million. (Note: some research groups report U.S. figures only. Global figures for 1995 and 1996 were derived from NUA estimates on U.S. Internet usage as a percent of global Internet usage.) (ibid. note 18, p. 53f)

Within days of the publication of the DoC Report in April 1998, adoption rate data with the signature 38, 13 and 4 years for radio, television and the Internet started to appear in media in the United States.

Then, in October 1998, the data jumped the Atlantic. In a report prepared for the European Commission (EC). This report copies a lot of material, uncredited, from the DoC report (op. cit.), including the following:

> Radio existed for thirty-eight years before it reached a penetration of 50 million listeners; television took thirteen years to reach 50 million viewers. […] In contrast to these other successful technologies, after becoming available to the public, the Internet required only four years to reach 50 million users. (Gerlach and Kohn, 1998, p. 10)

Having established itself in government-sponsored reports on both sides of the Atlantic, the idea now starts to mutate. For example: In January 1999, in an attachment to the Observer newspaper, the following statement appeared:

> The net is the most profound change in our communications environment since the invention of print. Just compare it to other media: Radio took about 37 years to reach its first 50 million listeners, while television took 15 years to reach the same target. The world wide web took just over three years. (Observer, 1999)

The most interesting change here is the transformation of the “Internet” into “the world wide web” and the year that is consequently subtracted from the time it took it to reach the benchmark 50 million users. Of course, as evident from the note accompanying the DoC report, the release of the Mosaic web browser in 1993 is the event used to identify the base year of the Internet (i.e. the Internet and the world wide web is considered identical for the purpose of computing this adoption rate). But here, somebody who is aware that there is a

difference has noted that while the Internet became commercially available in 1989, the World Wide Web did not appear until 1990, and deducted the intervening year to make it "right" before presenting the story to the public.

Then, the data in the Observer article is given another spin by a group of scientists. Neither the EC report nor the Observer articles give any clue about what geographical region the findings apply to, but the Morgan Stanley report where it all started stated explicitly that its data referred to the United States. When the Observer article is translated into scientific prose, its precision level is "improved" and its geographical coverage changed to be appropriate to the global scope inherent in the title of book (*Planet Internet*).

> It took radio 37 years to gain 50 million listeners world-wide. Television only required 15 years to gain 50 million viewers. The World Wide Web acquired 50 million surfers within 3 years. (Braa et al., 2000, p. 21, citing the above article in the Observer as source)

Science is Politics by Other Means[8]

I am amazed by the places this particular idea has managed to go after being released to the public in 1997, astounded by the sheer rate of imitation and amused by the number of individuals who have seen fit to work it into their conversation.

More interesting, however, is how these data is enrolled[9] in political discourse in support of various political agendas. The DoC and the EC reports that already has been mentioned are examples of such usages, and argues that the alleged exceptional adoption rate of the Internet, makes it, and the affiliated phenomenon "the digital economy" into something that need special consideration and political support.

In a parliamentary debate in Norway in 1999, representative Karl Eirik Schjøtt-Pedersen emphasised the importance for government of being "technology-friendly", citing the exceptional adoption rate of the Internet to lend support to this notion (Schjøtt-Pedersen, 1999).

A presentation for the House of Commons in the United Kingdom, by expert Alpesh Patel follows the same pattern:

> E-commerce presents an exceptional opportunity to benefit the nation through job creation, competitiveness, tax revenue, wealth creation. […] There is ample evidence to suggest the significant impact of e-commerce on industry, trade and the economic health of Britain. However, the importance is still underestimated by many. Estats reckoned a year ago that global internet traffic doubles every two days. It took radio 38 years to

[8] This particular twist on Prussian general Karl von Clausewitz' "War is politics by other means" was originally coined by Bruno Latour (Latour, 1988, p. 229).

[9] The notion of "enrolling" an actant (such as a particular data set) in a particular campaign is borrowed from of actor-network theory. For a review of vocabulary of ANT, see (Akrich and Latour, 1992).

> reach 50 million listeners, television took 13 years to reach 50 million users. The internet achieved 50 million users in four years. […] If we are to create e-commerce giants of the future to benefit Britain, urgent action needs to be taken now. (Patel, 1999)

Policy, however, does not usually entail from facts alone. Instead, concerns, ideologies and prejudices (among other things) negotiate policy, and facts are *then* enrolled to support whatever emerges. The occurrences of the idea that the Internet is characterised by an exceptional adoption rate in political discourse should therefore not been taken as evidence that this data actually has informed the policies in question, only as an indicator of its popularity as an ally in support of them. But this popularity may in part explain why it is repeated so frequently, and has been able to survive in the public discourse unchallenged for so long.

Conclusion

In this paper I've examined, in some detail, a popular statement that argues that the adoption rate of the Internet is exceptionally high compared to that of radio and television.

1. I've demonstrated that the data used to support this argument are tenuous, and that the interpretation of this data is further complicated by the fact that neither invention nor adoption are clear-cut events (in fact, they are processes).
2. I've shown, through careful compilation and examination of the historical record, that there appear to be no major difference between the adoption rate of the Internet and the patterns of adoption we know from radio and television in the past.
3. I've identified the discrepancy between the historical record and the popular narrative concerning these adoption rates as possibly resulting from translations of the data into carefully phrased re-statements of fact as in order to support a particular financial or political agenda.
4. I've argued that this particular misconception was able to ingrain itself in popular, political and academic discourse because our trust in, and reliance upon, media-constructed reality.

But as a final paradox, I would like to state that I probably would not have been able to write this essay without the Internet. The majority of the examples used to illustrate this case study were located through Internet search engines or with the help of individuals that I correspond with through the Internet. In most cases, I was also able to find the reports and articles cited online, or to order paper copies by means of online order forms.

The Internet has merit; it just can do without the hyperbole and ballyhoo.

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